New $PM_{2.5}$ NAAQS Impacts in The Horizon for Arizona

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Agenda

1. NAAQS Background and $PM_{2.5}$ Rulemaking
2. Attainment/Nonattainment Designations
3. Permitting and Modeling Impacts – Focus on Arizona

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1. NAAQS Background and $PM_{2.5}$ Rulemaking

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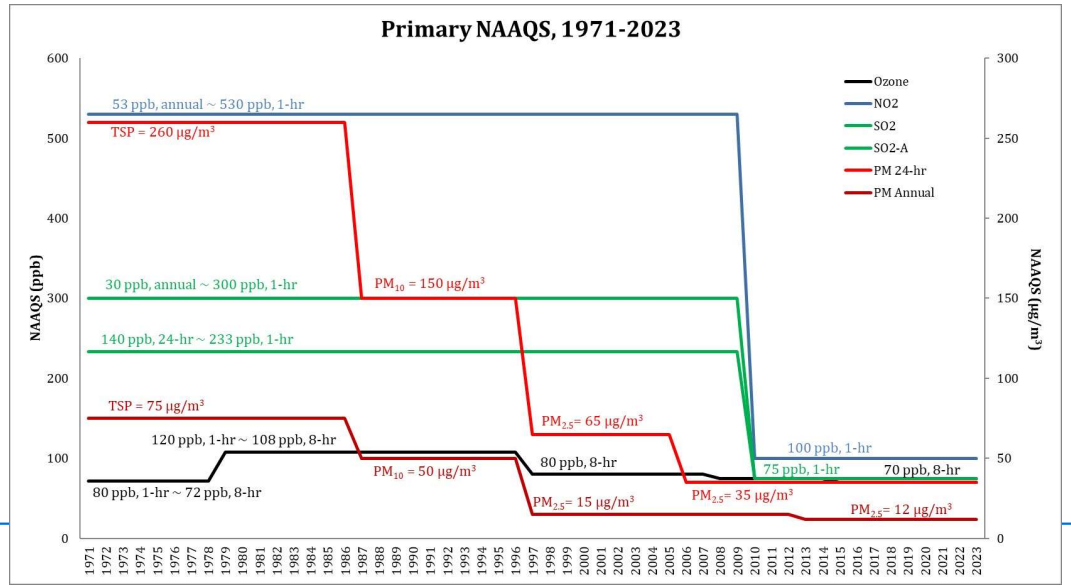
Clean Air Act and $PM_{2.5}$ NAAQS Background

- **National Ambient Air Quality Standards (NAAQS) -** Threshold levels of air pollution
  - Established by the 1970 Clean Air Act (CAA) for six (6) criteria pollutants
  - Primary (main impacts to permitting) and secondary standards
- NAAQS Do Change – EPA is required to review and revise, if necessary, every five years
  - EPA opened the $PM_{2.5}$ NAAQS review process in 2023



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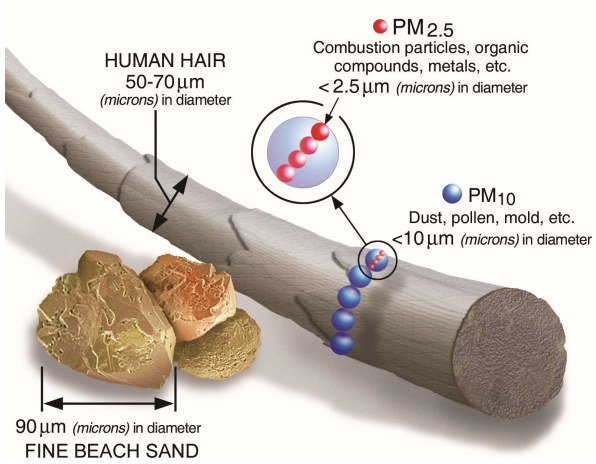
What is $PM_{2.5}$?

- **Particulate Matter (PM)** is a mixture of solid and liquid droplets

Primary PM (filterable + condensable) is emitted directly from a source.

+

Secondary PM is produced through reactions of chemicals in the atmosphere (e.g., NO_2, SO_2)



Source: https://www.epa.gov/pm-pollution

- Categories of PM with a NAAQS:
  - PM with an aerodynamic diameter ≤ 10 µm (**PM_{10}**)
  - PM with an aerodynamic diameter ≤ 2.5 µm (**$PM_{2.5}$**)

- $PM_{2.5}$ Precursors: SO_2 and NO_X as EPA default
  - **In Arizona,** VOC and ammonia are considered precursors in $PM_{2.5}$ nonattainment areas too
    - MCAQD - Rule 100 Section 200.112(b)
    - ADEQ – AAC R18-2-101.124.a

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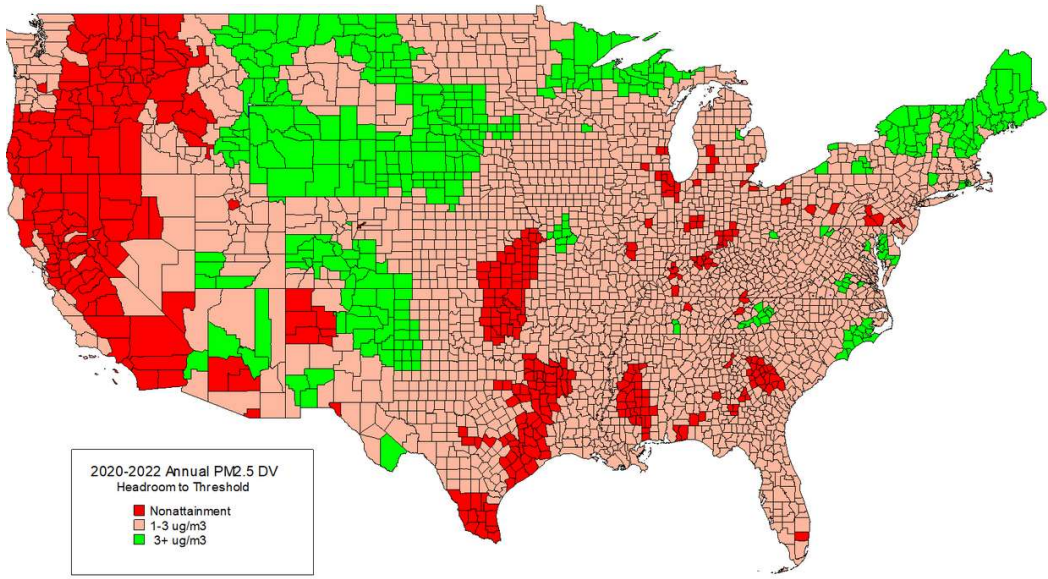
New Annual $PM_{2.5}$ NAAQS – What to Expect?

- **2/7/2024:** EPA announce the new annual $PM_{2.5}$ NAAQS at **9 µg/m³**
  - Lower than previous NAAQS - 12 µg/m³
  - Final rule has not yet been published on the federal register
- Now what?
  - Final rule issuance
    - NAAQS will be effective 60 days following final rule issuance
  - Several key state/federal decision-making dates will follow (next slides)
  - Anticipate litigation against new NAAQS (e.g., trade associations, etc.)
  - **New annual $PM_{2.5}$ Significant Impact Level (SIL)** threshold – anticipated on or before new NAAQS effective date



Source: https://www.afandpa.org/news/2024/afpa-and-awc-respond-epas-pm-naaqs-rule

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Modeling Thresholds – Including NAAQS and SILs

Currently under revision

New

PSD Significant Emission Rates (SERs), Significant Monitoring Concentrations (SMCs), Significant Impact Levels (SILs), PSD Increments and National Ambient Air Quality Standards (NAAQS) – Page 1 of 2

Pollutant	Averaging Period	PSD Significant Emission Rates (SERs)[a] (tons/year)	Significant Monitoring Concentrations (SMCs) (µg/m³)	Class II Significant Impact Levels (SILs) (µg/m³)	PSD Increments (µg/m³) Class I	PSD Increments (µg/m³) Class II	National Ambient Air Quality Standards (NAAQS)[b] Primary (µg/m³)	Primary (ppm)	Secondary (µg/m³)	Secondary (ppm)	Form (i.e., How Standard is Applied)
PM_{10}	Annual	15[c]	--	1	4	17	~~50~~[d]	~~--~~[d]	~~50~~[d]	~~--~~[d]	~~Annual arithmetic mean, averaged over 3 years~~[d]
	24-hour		10	5	8	30	150	--	150	--	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	Annual	10 of $PM_{2.5}$ 40 of SO_2 40 of NO_X[e]	--	0.2[f]	1	4	9.0	--	15.0	--	Annual arithmetic mean from single or multiple monitors, averaged over 3 years
	24-hour		0[g]	1.2[f]	2	9	35	--	35	--	98th percentile of concentrations in a given year, averaged over 3 years
SO_2[h]	Annual	40	--	1	2	20	~~(80)~~	~~0.03~~	--	--	~~Annual arithmetic mean~~
	24-hour		13	5	5	91	~~(365)~~	~~0.14~~	--	--	~~Not to be exceeded more than once per calendar year~~
	3-hour		--	25	25	512	--	--	(1,300)	0.5	Not to be exceeded more than once per calendar year
	1-hour		--[i]	--[i]	--[i]	--[i]	(196)	0.075	--	--	3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations
NO_2	Annual	40 of NO_X	14	1	2.5	25	(100)	0.053	(100)	0.053	Annual arithmetic mean
	1-hour		--[i]	--[i]	--[i]	--[i]	(188)	0.1	--	--	3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour concentrations
Ozone	8-hour	40 of VOC or NO_X	VOC or NO_X emissions increase > 100 tpy	1 ppb	--	--	(137)	0.070	(137)	0.070	3-year average of annual 4th highest daily maximum 8-hour concentrations
CO	8-hour	100	575	500	--	--	(10,000)	9	--	--	Not to be exceeded more than once per calendar year
	1-hour		--	2,000	--	--	(40,000)	35	--	--	Not to be exceeded more than once per calendar year
Lead[j]	Rolling 3-month avg.	0.6	0.1	--	--	--	0.15	--	0.15	--	Maximum arithmetic mean

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New Annual $PM_{2.5}$ NAAQS – Anticipated Timeline

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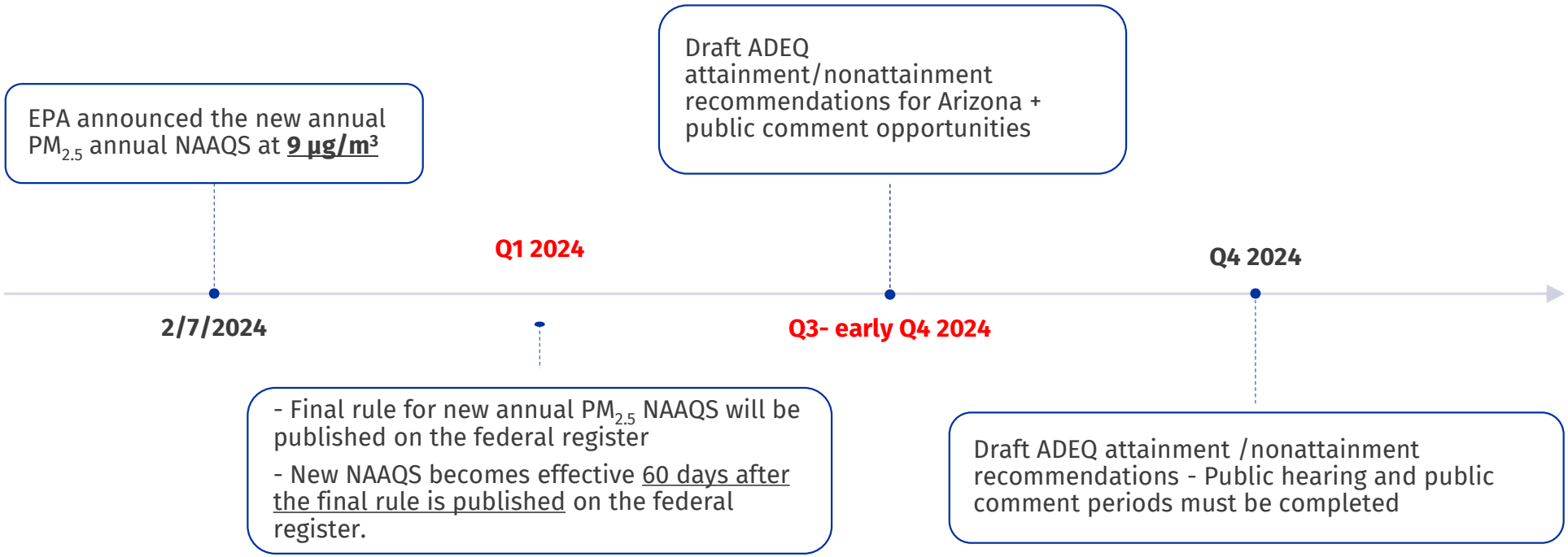

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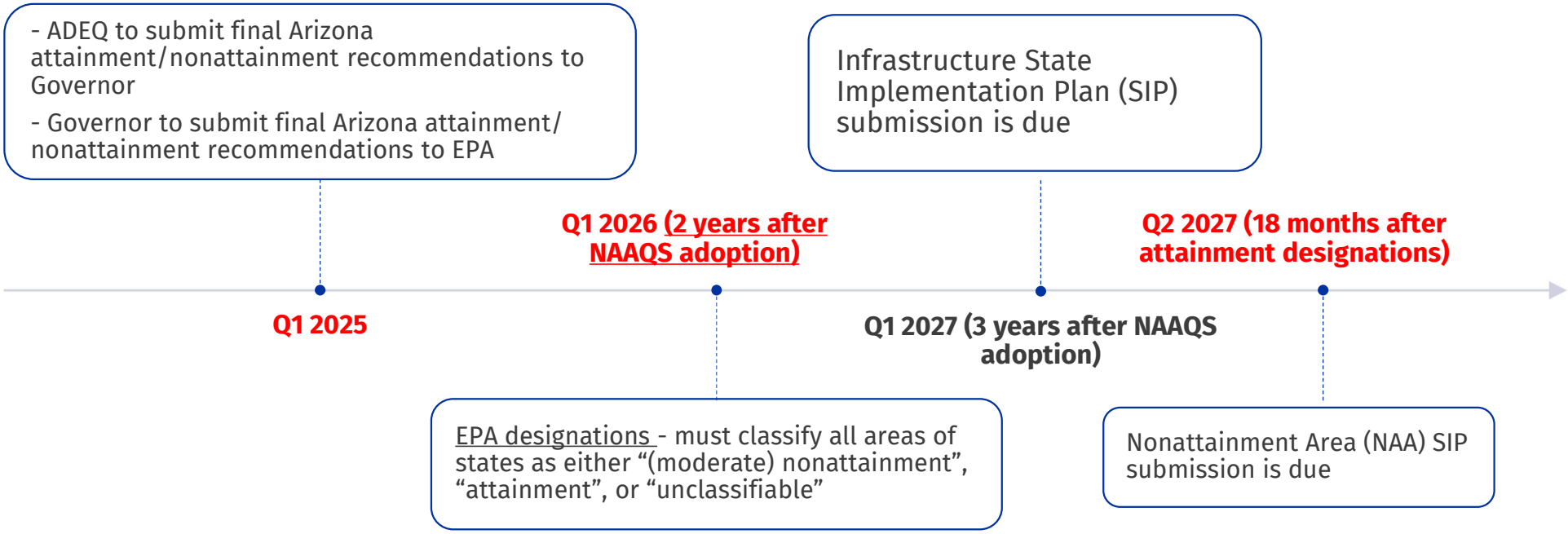
New Annual $PM_{2.5}$ NAAQS – Anticipated Timeline

Slide 2 of 2



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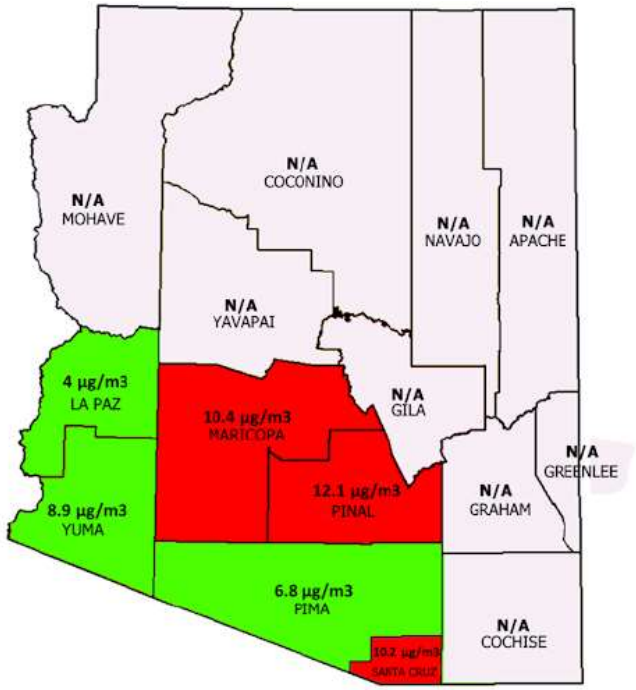
2. Attainment/Nonattainment Designations

$PM_{2.5}$ Attainment Designations in Arizona

Slide 1 of 2

- If ambient concentrations > NAAQS – **"Nonattainment" (NA) Area**
  - Additional requirements for stationary sources of air pollutants
  - Increasingly complex air permitting
  - State regulations are more stringent
- In Arizona, anticipate PM_{10} NA areas to "predict" location of future $PM_{2.5}$ future NA areas
- Factors considered:
  - Air Quality Data
  - Emissions-Related Data
  - Meteorology
  - Geography/Topography
  - Jurisdictional Boundaries



Note: NAAs will cover only a portion of the counties

Source: ADEQ presentation for the Arizona Chamber of Commerce meeting held on 11/7/2023

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$PM_{2.5}$ Attainment Designations in Arizona

Slide 2 of 2

- **What can you do as part of $PM_{2.5}$ NAAQS attainment status designation process?**
  - Respond to data requests from state/local authorities to inform proposed $PM_{2.5}$ NAAQS designations
  - Ensure actual direct $PM_{2.5}$ & $PM_{2.5}$ precursor emissions inventory is complete, accurate, and fully representative of current plant sources
  - Follow state/local proposed designations for your area
  - Follow EPA "120-day letter" responses to state/local proposals
  - Follow EPA proposed designations in Federal Register, etc.
  - Discuss concerns with state/local agencies to improve outcomes (e.g., better nonattainment area boundaries)

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3. Permitting and Modeling Impacts – Focus on Arizona

Scenarios - Current and Recent Permit Applications

- **Project at a facility received a final permit before the effective date of the new $PM_{2.5}$ NAAQS**
  - No new requirements - permitting already finalized
  - Facility can proceed with the project

- **A facility has a permit action in process when the new $PM_{2.5}$ NAAQS becomes effective**
  - Modeling must be passing for new NAAQS (submit revised modeling if needed)
  - Source needs to submit revised modeling until above criteria is met
  - The agency may issue a final permit if modeling is approved

- **Upcoming project will increase $PM_{2.5}$ emissions and require modeling**
  - If attainment: Modeling must be passing for new NAAQS.
  - If nonattainment area:
    - If minor NSR modeling triggered, need to pass for new NAAQS.
    - If federal nonattainment NSR permitting triggered, emission offsets (1:1 ratio) and **LAER** required

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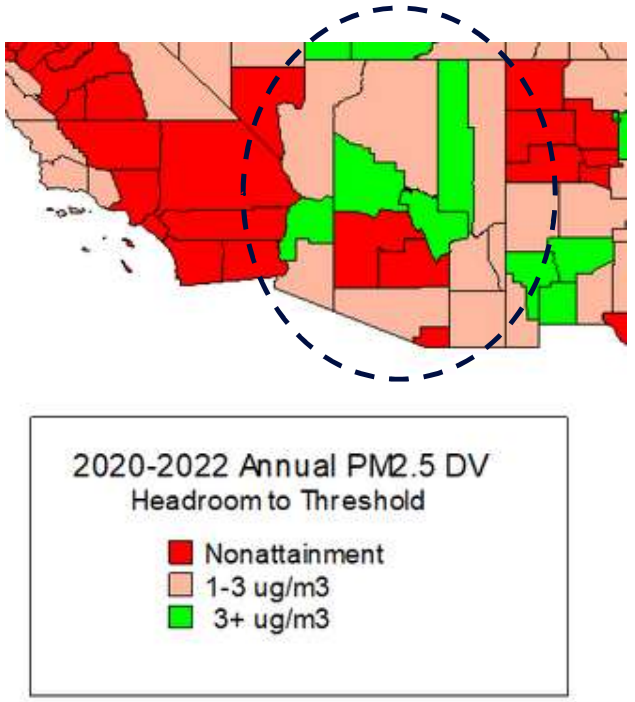
Permitting Impacts – Attainment Areas

- If local minor NSR or federal PSD review required for $PM_{2.5}$, anticipate challenges with modeling
- To demonstrate NAAQS compliance:

Site impacts + nearby source impacts + **background concentrations** < NAAQS

- Very little headroom in certain areas
  - Example: Yuma County has a background concentration of 8.9 µg/m^3, so site impacts and nearby sources can contribute a maximum of 0.1 µg/m^3 to meet the NAAQS.
  - Concerning for industrial growth!
  - **Remember: passing model = permit = ability to construct**



Source: https://www.afandpa.org/news/2024/afpa-and-awc-respond-epas-pm-naaqs-rule

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More on Background Concentrations

- **Preconstruction monitoring** - may be advantageous to obtain **site-specific** background $PM_{2.5}$ data rather than relying on agency data collected in more polluted urban areas
- **Some positive news - retroactive adjustment of $PM_{2.5}$ monitoring data** – Certain EPA network monitors reported higher data that will be retroactively corrected before May 1, 2024.
- **More updates to EPA monitor network due to Environmental Justice (EJ):** For areas with additional required state or local air monitoring stations, a monitoring station is to be sited in an at-risk community

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Permitting Impacts – New Nonattainment Areas

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- In 2026: Anticipate nonattainment areas in the following counties: **Maricopa, Pinal, Santa Cruz**
  - Initial moderate nonattainment classification
  - 100 tpy major source threshold
- Projects at new major sources ($PM_{2.5}$ emission increases ≥ 100 tpy) or major modifications at existing major sources ($PM_{2.5}$ emission increases ≥ 40 tpy) → triggers nonattainment NSR (NNSR) permitting:
  - Complex requirements:
    - Lowest Achievable Emission Rate (LAER) – Control technology evaluation more stringent than RACT and BACT.
    - Emission offsets → Require offsets in 1:1 ratio
- Modeling is still a concern in nonattainment areas if minor NSR is triggered! Hard to achieve passing models with high background concentrations

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Permitting Impacts – New Nonattainment Areas

Slide 2 of 2

- **Ammonia (NH_3)** would become a regulated pollutant as a $PM_{2.5}$ precursor in Arizona:
  - MCAQD - Rule 100 Section 200.112(b)
  - ADEQ – AAC R18-2-101.124.a
- In ADEQ, $PM_{2.5}$ nonattainment areas, Class II permitting requirements may be triggered by NH_3 emissions **≥ 40 tpy**
  - Upon SIP approval by EPA

> f. In $PM_{2.5}$ nonattainment areas, for purposes of determining the applicability of R18-2-403 or R18-2-404, an emission rate that would equal or exceed 40 tons per year of ammonia, as a precursor to $PM_{2.5}$. This subsection shall take effect on the effective date of the Administrator's action approving it as part of the state implementation plan.

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Other Considerations – New $PM_{2.5}$ Nonattainment Areas

- Local agencies are required to implement **Reasonably Available Control Measures and Technology (RACM/RACT)**
  - Clean Air Act (CAA) requirement to be addressed in the Nonattainment SIP
  - RACM – *"Any technologically and economically feasible measure* ***that can be implemented in whole or in part within four years after the effective date of designation of a $PM_{2.5}$ nonattainment area*** *and that achieves permanent and enforceable reductions in direct PM2.5 emissions and/or PM2.5 plan precursor emissions from sources in the area."*
  - Anticipate rule amendments to achieve implementation at existing sources in the nonattainment area
- CAA also requires reasonable further progress
- Risk of reclassification to "serious" status if attainment with the NAAQS is not achieved

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Key Takeaways

- New $PM_{2.5}$ NAAQS of **9 µg/m³** anticipated to become effective in Q1 2024 – will result in additional modeling challenges for existing (pending permit) and future projects.
  - High background concentrations
  - EPA will also establish a new SIL before new NAAQS effective date
  - Concern for industrial growth
- Draft attainment/nonattainment designations ancticipated by Q3 of 2024
  - Discuss concerns with state/local agencies to improve outcomes
  - Anticipate nonattainment areas in the following: Maricopa, Pinal, and Santa Cruz counties.
- Lower NAAQS will result in more complex modeling – triggered by minor NSR (attainment or nonattainment area) or PSD (attainment)
- RACM levels of control would need to be implemented by sources in nonattainment areas - Potential revisions to local regulations

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Questions?

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